Amendments to the Claims

Please cancel claim 5 without prejudice.

1. (currently amended) A computer-implemented method for processing numerical values in a computer program executable on a computer system, comprising:

encapsulating in a large-integer datatype, large-integer data and associated operators, wherein the large-integer data has runtime expandable precision and maximum precision is limited only by system memory availability; and

overloading language-provided arithmetic, logical, and type conversion operators with the large-integer operators that operate on large-integer variables in combination with other datatypes, and programmed usage of a variable of the large-integer datatype is equivalent to and interoperable with a variable of a system-defined integral datatype;

establishing a plurality of available storage nodes available for allocation to large-integer data; and

allocating a subset of the plurality of available storage nodes for a large-integer variable, the subset being an allocated plurality of storage nodes, and storing a numerical value in the allocated plurality of storage nodes and forming a linked list of the allocated plurality of storage nodes.

- 2. (original) The method of claim 1, further comprising converting a character string into large-integer data in response to a constant definition statement.
- 3. (original) The method of claim 2, further comprising converting large-integer data to and from a character string for input, output, and serialization.
- 4. (original) The method of claim 1, further comprising:

converting input data from language-provided input functions to large-integer data; and

converting large-integer data to a format compatible with language-provided output functions.

5. (canceled)

- 6. (currently amended) The method of claim 1 5, further comprising allocating a selected number of bits for each storage node in response to a program-specified parameter.
- 7. (currently amended) The method of claim <u>1</u> €, further comprising dynamically allocating a number of storage nodes for storage of the numerical value as a function of a size of the numerical value.
- 8. (currently amended) The method of claim 7, further comprising storing in each node that is allocated to <u>a</u> large-integer variable, a subset of bit values that represent a numerical value.
- 9. (original) The method of claim 8, further comprising:

maintaining a set of available storage nodes that are not allocated to any largeinteger variable;

allocating a storage node from the set of available storage nodes to a large-integer variable while performing a large-integer operation that generates a numerical value and stores the numerical value in the variable, if a number of bit values required to represent the numerical value exceeds storage available in storage nodes allocated to the large-integer variable; and

returning to the set of available storage nodes a storage node allocated to a large-integer variable while performing a large-integer operation that generates a numerical value for storage in the variable, if a number of bit values required to represent the numerical value is less than storage available in storage nodes allocated to the variable.

- 10. (original) The method of claim 9, further comprising overloading language-provided memory allocation and deallocation operators with large-integer operators that allocate and deallocate storage nodes.
- 11. (original) The method of claim 1, further comprising, responsive to a large-integer divide operation specifying an input dividend and divisor:

identifying a set of most-significant bits of the dividend and a set of leastsignificant bits of the dividend;

recursively performing a large-integer divide operation using the set of mostsignificant bits as the input dividend, and returning a quotient and a remainder;

finding a lower-part dividend as a function of the remainder and the set of leastsignificant bits;

recursively performing a large-integer divide operation using the lower-part dividend; and

concurrently solving for the quotient and the remainder.

- 12. (original) The method of claim 11, further comprising identifying an optimal set of most-significant bits of the dividend and a set of least-significant bits of the dividend as a function of a number of bits that represent the dividend and a number of bits that represent the divisor.
- 13. (currently amended) The method of claim 12, further comprising identifying an optimal set of most-significant bits of the dividend and a set of least-significant bits of the dividend as a function of one-half a difference between the number of bits that represent the dividend and the number of bits that represent the divisor.
- 14. (original) The method of claim 1, further comprising emulating fixed-bit arithmetic on variables of the large-integer data type.
- 15. (original) The method of claim 1, further comprising transferring data associated with temporary variables of the large-integer datatype by moving pointers to the data.

16. (original) The method of claim 1, further comprising

encapsulating in a large-floating-point datatype, large-floating-point data and associated operators, wherein the large-floating-point data has runtime expandable precision and maximum precision is limited only by system memory availability; and

overloading language-provided arithmetic, logical, and type conversion operators for floating-point data with the large-floating-point datatype operators that operate on large-floating-point variables in combination with other datatypes, and programmed usage of a variable of the large-floating-point datatype is equivalent to and interoperable with a variable of a system-defined floating-point datatype.

17. (original) The method of claim 1, further comprising

encapsulating in a large-rational datatype, large-rational data and associated operators, wherein the large-rational data has runtime expandable precision and maximum precision is limited only by system memory availability; and

overloading language-provided arithmetic, logical, and type conversion operators for rational data with the large-rational datatype operators that operate on large-rational variables in combination with other datatypes, and programmed usage of a variable of the large-rational datatype is equivalent to and interoperable with a variable of a system-defined rational datatype.

18. (currently amended) An apparatus for processing numerical values in a computer program executable on a computer system, comprising:

means for encapsulating in a large-integer datatype, large-integer data and associated operators, wherein the large-integer data has runtime expandable precision and maximum precision is limited only by system memory availability; and

means for overloading language-provided arithmetic, logical, and type conversion operators for integers with the large-integer datatype operators that operate on large-integer variables in combination with other datatypes, and programmed usage of a variable of the large-integer datatype is equivalent to and interoperable with a variable of a system-defined integral datatype;

means for establishing a plurality of allocable storage nodes available for allocation to large-integer data;

means for allocating, for a large-integer variable, a subset of the plurality of allocable storage nodes, the subset becoming an allocated plurality of storage nodes for the large-integer variable; and

means for storing a numerical value in the allocated plurality of storage nodes and forming a linked list of the allocated plurality of storage nodes.

19. (original) The apparatus of claim 18, further comprising

means for encapsulating in a large-floating-point datatype, large-floating-point data and associated operators, wherein the large-floating-point data has runtime expandable precision and maximum precision is limited only by system memory availability; and

means for overloading language-provided arithmetic, logical, and type conversion operators for floating-point data with the large-floating-point datatype operators that operate on large-floating-point variables in combination with other datatypes, and programmed usage of a variable of the large-floating-point datatype is equivalent to and interoperable with a variable of a system-defined floating-point datatype.

20. (original) The apparatus of claim 18, further comprising

means for encapsulating in a large-rational datatype, large-rational data and associated operators, wherein the large-rational data has runtime expandable precision and maximum precision is limited only by system memory availability; and

means for overloading language-provided arithmetic, logical, and type conversion operators for rational data with the large-rational datatype operators that operate on large-rational variables in combination with other datatypes, and programmed usage of a variable of the large-rational datatype is equivalent to and interoperable with a variable of a system-defined rational datatype.

21. (new) The method of claim 1, further comprising:

RA-5417 10/008,952

determining a total number of available storage nodes available for allocation to large-integer data;

allocating memory for a first number of available storage nodes, responsive to the total number being less than first threshold value, and establishing the first number of available storage nodes; and

removing from the plurality of available storage nodes, responsive to the total number being greater than a second threshold value, a second number of storage nodes and deallocating memory for the second number of storage nodes.